American International University-Bangladesh (AIUB)
Faculty of Engineering

Digital Logic and Circuits

OBE Assignment

Total: 30 Marks Fall 20-21

Submission Deadline: 18.12.2020 (11:59:59 pm)

Submission Link: https://forms.gle/9tjZZeZgpDecwPTU9

CO3	Formulate solutions, procedures, and methods to solve complex engineering problems using concept of digital logic and circuits at gate and transistor level.	P.b.2.C4

A medical team have approached AIUB to design a (hypothetical) patient monitoring system. The design includes three sensors to monitor three different parameters of a patient. These sensors act as the input to the system. The output of the system is an alarm which will aware the medical team of a potential danger. Sensor A measures the blood pressure and produces a HIGH when the pressure falls below a threshold level. Sensor B measures the blood oxygen level and produces a HIGH when the oxygen level is below a threshold level. And sensor C measures the pulse rate which produces a HIGH when the pulse rate goes above a particular threshold level. Now the alarm should be activated only in the following conditions:

- If blood pressure is below threshold and oxygen level is below threshold.
- If blood pressure is below threshold and pulse rate is above threshold.
- If oxygen level is below threshold and pulse rate is above threshold.
- If blood pressure is below threshold, oxygen level is below threshold and pulse rate is above threshold.

Your task is to:

i. Design the digital system, showing the required steps, which will trigger the alarm and implement the system with CMOS logic.
ii. Design the alarm timer circuit with a frequency of YYY kHz and a duty cycle of XX%.

Direction: The numbers YYY are the first three digits and XX are the last two digits of the middle part of your ID (SS-YYYXX-S)
(In case the last two letters of your ID is 00, use 36 instead.)

SUBMISSION GUIDELINES:

- The assignment should only be submitted in the form. No submissions in any other medium will be accepted!!!
- The assignment will not be accepted after the submission deadline (Strictly on or before deadline)!!!!!
- Make sure to write your name on top of each paper you use. (MUST)
- The assignment MUST be submitted in PDF and the size MUST not exceed 10MB.
- Any trace of copying will result in 0 for that section.

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MARKING RUBRIC:

CP	Assessment Criteria	Evaluation Criteria				Marks
		Poor [1-4]	Average [5-8]	Good [9-11]	Excellent [12-15]	
CP1	Digital Triggering Circuit Design.	Design flow has major errors and transistor level design has major flaws.	Design Flow has major error with error carried forward to transistor level design	Design Flow has minor error with error carried forward to transistor level design	Accurate Design Flow with transistor level design having no or minor errors	
CP4	Alarm/ Buzzer Design	Alarm design has major flaws with major calculation errors/ The design is inappropriate	Alarm design has major flaws with minor calculation errors.	Alarm design has minor flaws with major calculation errors.	The alarm design is correct with no or minor calculation errors.	
					Total Marks Obtained	